

**Closure Report
For the UST Site 22
Tinker Air Force Base, Oklahoma**

**Facility Number 55-08120
Case Number 064-1106**



**Contract F34650-93-D-0106
Delivery Order 5017**

**Department of the Air Force
Oklahoma City Air Logistics Center
Tinker Air Force Base**

November 1999

**CLOSURE REPORT
FOR THE UST SITE 22
TINKER AIR FORCE BASE, OKLAHOMA**

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**Facility Number 55-08120
Case Number 064-1106**

November 1999

Prepared for

**DEPARTMENT OF THE AIR FORCE
OKLAHOMA AIR LOGISTICS CENTER
TINKER AIR FORCE BASE**

Prepared by

**PARSONS ENGINEERING SCIENCE, INC.
MIDWEST CITY, OKLAHOMA**

**Contract F34650-93-D-0106
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ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	Benxene, Toluene, Ethylbenzene, and Xylene
COC	Chemicals of concern
°F	degrees Fahrenheit
DD	Decision document
DRO	Diesel range organics
ERPIMS	Environmental Resources Program Information Management System
GRO	Gasoline range organics
HSZ	Hennessey saturated zone
ISCR	Initial Site Characterization Report
ISGC	Investigation for Soil and Groundwater Cleanup
LSZ	Lower saturated zone
msl	mean sea level
OAC	Oklahoma Administrative Code
OCC	Oklahoma Corporation Commission
ODEQ	Oklahoma Department of Environmental Quality
ORBCA	Oklahoma Risk-Based Corrective Action
Parsons ES	Parsons Engineering Science
PZ	Producing zone
RBCA	Risk based corrective action
RBSLs	Risk based screening levels
RCRA	Resource Conservation and Recovery Act
Tetra Tech	Tetra Tech, Inc.
TPH	Total petroleum hydrocarbons
USDA	United States Department of Agriculture
UST	Underground storage tank
USZ	Upper saturated zone

SECTION 1

INTRODUCTION

This decision document (DD) supports the no further action alternative for UST Site 22 at Tinker Air Force Base (AFB), Oklahoma. The purpose of the DD is to summarize the existing data for the site and to describe the Air Force's rationale for selecting the no-further-action alternative. The objectives of this DD for the UST Site 22 are:

- To briefly describe the location, history, and environmental setting of the site;
- To summarize the results from previous investigations; and
- To assess the risk to human health and the environment.

Data used to support the no action alternative for this site was obtained from the UST Site 22 Oklahoma Risk-Based Corrective Action (ORBCA) Assessment Report (Parson ES, 1998).

1.1 SITE LOCATION AND DESCRIPTION

Tinker AFB is located in Oklahoma County in central Oklahoma, approximately 8 miles southeast of downtown Oklahoma City. Figure 1.1 shows the location of Tinker AFB. The base is bounded by Sooner Road to the west, Douglas Boulevard to the east, Interstate 40 to the north, and Southeast 74th Street to the south.

Tinker AFB was established in 1941 as an aircraft maintenance and supply depot, comprising 1,460 acres. Land has been acquired to the west, east, and south, which has been used over the years as additional depot facilities, support facilities, military housing and recreational facilities. Apart from the main Base, Tinker AFB operates six satellite areas. As of 1999, the base encompasses 5,277 acres and contains approximately 747 buildings. Tinker AFB presently serves as a worldwide repair depot for a variety of aircraft, weapons, and engines.

Site 22 is located in the north-central portion of Tinker AFB and is comprised of USTs 482 and 487. The site is within a designated controlled area secured by a fence. Tank 482 is adjacent to the northeastern side of the transport pump shelter facility (Building 486), an open-ended structure that is part of the aircraft hydrant refueling system. Tank 482 is a fuel purge tank, historically used for JP-4 fuel and currently JP-8, and is connected to the hydrant refueling system. As part of the Military Construction Plan to Upgrade and Replace USTs at Tinker AFB, UST 482 was removed in January 1995 and replaced with a double-walled, fiberglass-coated steel tank. UST 487 is a 4,000-gallon, steel tank installed in 1978 and used for diesel storage. The UST and affected media were evaluated in accordance with applicable requirements of the Oklahoma Administrative Code (OAC)

165:25-3 under Oklahoma Corporation Commission (OCC) case number 064-1106. Figure 1.2 shows the site location and surrounding buildings.

1.1.1 Adjacent Land Uses

Site 22 and the area within a one-half mile radius is completely within the property boundaries of Tinker AFB. This area consists of numerous on-base facilities. The closest occupied building to the site is the Base Support Supply Building, Building 469, which is located approximately 500 feet to the north. Building 477, the Base Commissary, is located approximately 600 feet to the west. Numerous buildings are located east of the site; the closest is Building 260 (Air Freight), which is approximately 600 feet to the southeast. Taxiway M is approximately 600 feet south of Site 22 and is located approximately one-half mile south of the northern boundary of Tinker AFB (Interstate 40).

1.1.2 Nearby Population

The nearest residential area to this site is located off base about 4,000 feet north of the site. This high-density development consists of single family and multi family housing that are located behind commercial property and within Midwest City. Air Force personnel are located in base housing facilities, about one mile west and southwest of the site. The base accommodates seven dormitories and 730 family housing units. Commercial on-base workers occupy the numerous buildings that surround the site.

1.1.3 Surface and Groundwater Resources

Tinker AFB is located within the Central Redbed Plains section of the Central Lowland Physiographic province. Elevations in Oklahoma County range from about 850 feet to 1,400 feet above mean sea level. The topography is characterized by almost level to gently rolling hills, broad flat plains, and well-entrenched main streams. The valleys of secondary streams may exhibit a sag and swale appearance indicating the erosion of residual soil that is somewhat cohesive. The ground surface at Tinker AFB varies in elevation from approximately 1,320 feet mean seal level (msl) in the southeastern portion of the base to 1,190 feet msl in the northwestern portion of the base. Local relief is primarily the result of dissection by erosional activity or stream channel development (Parsons ES, 1999).

Surface drainage on Tinker AFB is accomplished by overland flow of runoff to diversion structures, and then to area surface streams. Figure 1.3 shows the surface water drainage paths at Tinker AFB. Surface hydrology for Tinker AFB is dominated by Crutch Creek, Kuhlman Creek, Soldier Creek, and Elm Creek. Soldier Creek and Crutch Creek are perennial streams. Soldier Creek, which would be intermittent at the

base under natural conditions, is perennial due to discharges from drainage features and cooling towers associated with Building 3001. Soldier Creek flows into Crutch Creek, which discharges into the North Canadian River located approximately six miles north of Tinker AFB. Crutch Creek and a tributary, Kuhlman Creek, drain most of the base. The northeastern portion of the base is drained by Soldier Creek, and the extreme southeastern portion of the base is drained by Elm Creek. Elm Creek and one small-unnamed stream cross installation boundaries south of the main instrument runway, and generally do not receive significant quantities of base runoff due to site grading designed to preclude such drainage. Elm Creek discharges into the Stanley Draper Lake, which is located less than one mile south of the southeastern border of the base (Parsons ES, 1999).

An important source of potable groundwater in the Oklahoma City metropolitan area is the central Oklahoma aquifer system, which extends under much of central Oklahoma and includes water in the Garber Sandstone and Wellington Formation. The Garber Sandstone and the Wellington Formation portions of the central Oklahoma aquifer system are commonly referred to as the "Garber-Wellington aquifer" and is considered to be a single aquifer because these units were deposited under similar conditions. The nearby communities of Midwest City and Del City derive their water supplies from surface sources, but have wells using the aquifer in the event of an emergency. Industrial operations, individual homes, farm irrigation, and small communities not served by municipal distribution systems also depend on the Garber-Wellington aquifer. Communities presently depending upon surface water supplies, such as Oklahoma City, also maintain a well system drilled into the Garber-Wellington as a standby source of water in the event of drought (Parsons ES, 1999).

Tinker AFB lies within the limits of the Garber-Wellington groundwater basin. At the present time, Tinker AFB derives most of its water supply from this aquifer and supplements the supply by purchasing from the Oklahoma City Water Department. The closest Tinker AFB water supply well to the site is located approximately 1,800 feet to the southwest, along Air Depot Road. The nearest private water supply well is approximately one mile north of UST Site 22.

1.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

1.2.1 History

A 1995 investigation of UST Site 22 concluded that possible multiple sources may have contributed to the contamination at the site, but that UST 487 was not likely one of the sources. In addition, since UST 482 and its associated backfill soil were excavated and disposed in 1995, UST 482 was not considered a current active source. UST 482 was

replaced with a double walled, fiberglass coated steel tank with leak detection upgrades and is now used to store JP-8. The Investigations for Soil and Groundwater Cleanup (ISGC) (Tetra Tech, 1996) concluded that other potential sources were two ASTs that contain jet fuel in Building 488, various underground piping, and Building 486, which is a pump shelter facility and part of the Base hydrant refueling system. The ISGC data indicated that contamination associated with this UST had not migrated off site and is not expected to impact offsite water wells. A detailed site layout and history of Site 22 can be found in the ORBCA Summary Report for the site (Parsons ES, 1998).

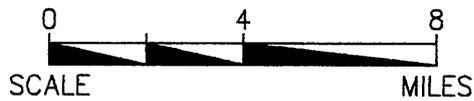
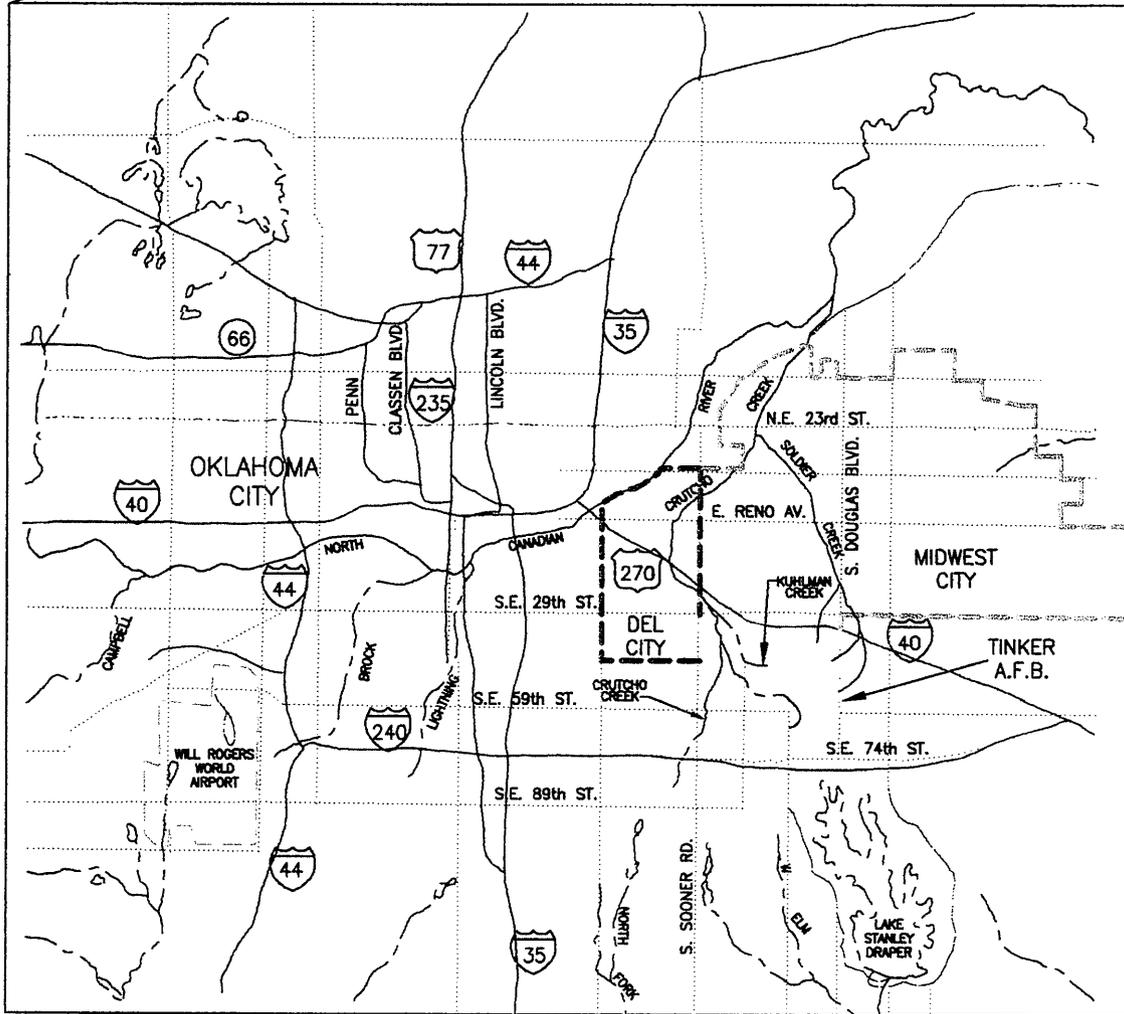
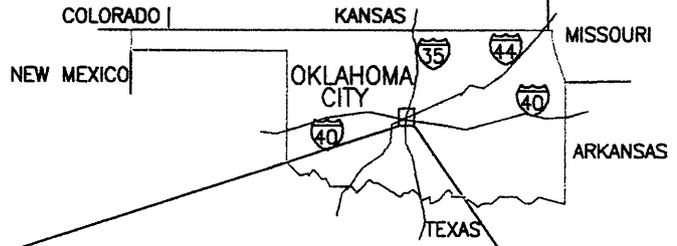
In accordance with OAC165:25-3-74, an ORBCA Tier 1/1A review of the site was completed in 1998 (Parsons ES, 1998). ORBCA assessments are conducted in conformance with American Society for Testing and Materials (ASTM) Method E1739 for Risk Based Corrective Action (RBCA). The investigation of the soil and groundwater at the site indicated subsurface contamination was below laboratory detection limits or did not exceed the Tier 1/1A levels for fuel compounds and chemicals of concern (COC) regulated by the OCC. The ORBCA Report recommended closure of the site in accordance with Tier 1/1A closure guidelines.

1.2.2 Regulatory Agency Activities

The ISGC report was completed by Tetra Tech in May 1996 and was submitted to the OCC for review. The OCC denied approval of the ISGC report and directed that an evaluation of the site be conducted in accordance with ORBCA requirements using the May 1996 ISGC data. Following review of the initial UST Site 22 ORBCA Report the OCC required that additional field data be collected to support closure of the site. An additional monitoring well was installed at the site, all the monitoring wells at the site were re-sampled, and water samples were collected from the nearby Kuhlman Creek. The revised UST Site 22 ORBCA Report (Parsons ES, 1998) was re-submitted, the OCC concluded that no further action was required and closed the case on September 24, 1999 in accordance with OAC 165:25-3-79. In summary, all OCC comments and requirements were implemented or fulfilled for this site.

1.3 COMMUNITY PARTICIPATION

There has been no community involvement in the ORBCA investigation conducted at the UST Site 22 at Tinker AFB, Oklahoma.

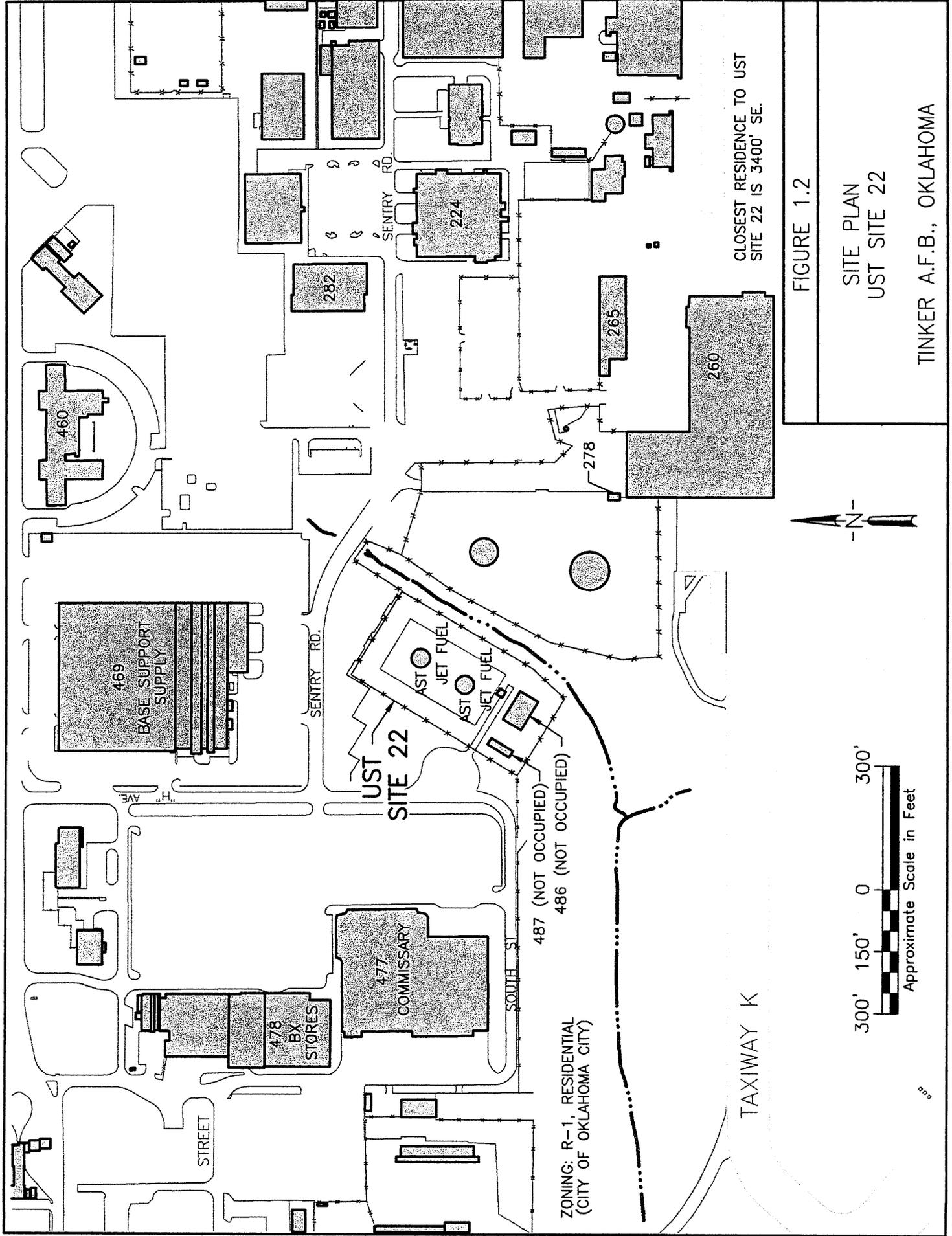


- LEGEND
- HIGHWAY OR INTERSTATE
 - MAJOR ROAD
 - ~~~~ RIVER OR CREEK
 - - - - MUNICIPAL BOUNDARIES
 - ▭ TINKER AFB

FIGURE 1.1

TINKER AIR FORCE BASE
LOCATION MAP

TINKER A.F.B., OKLAHOMA



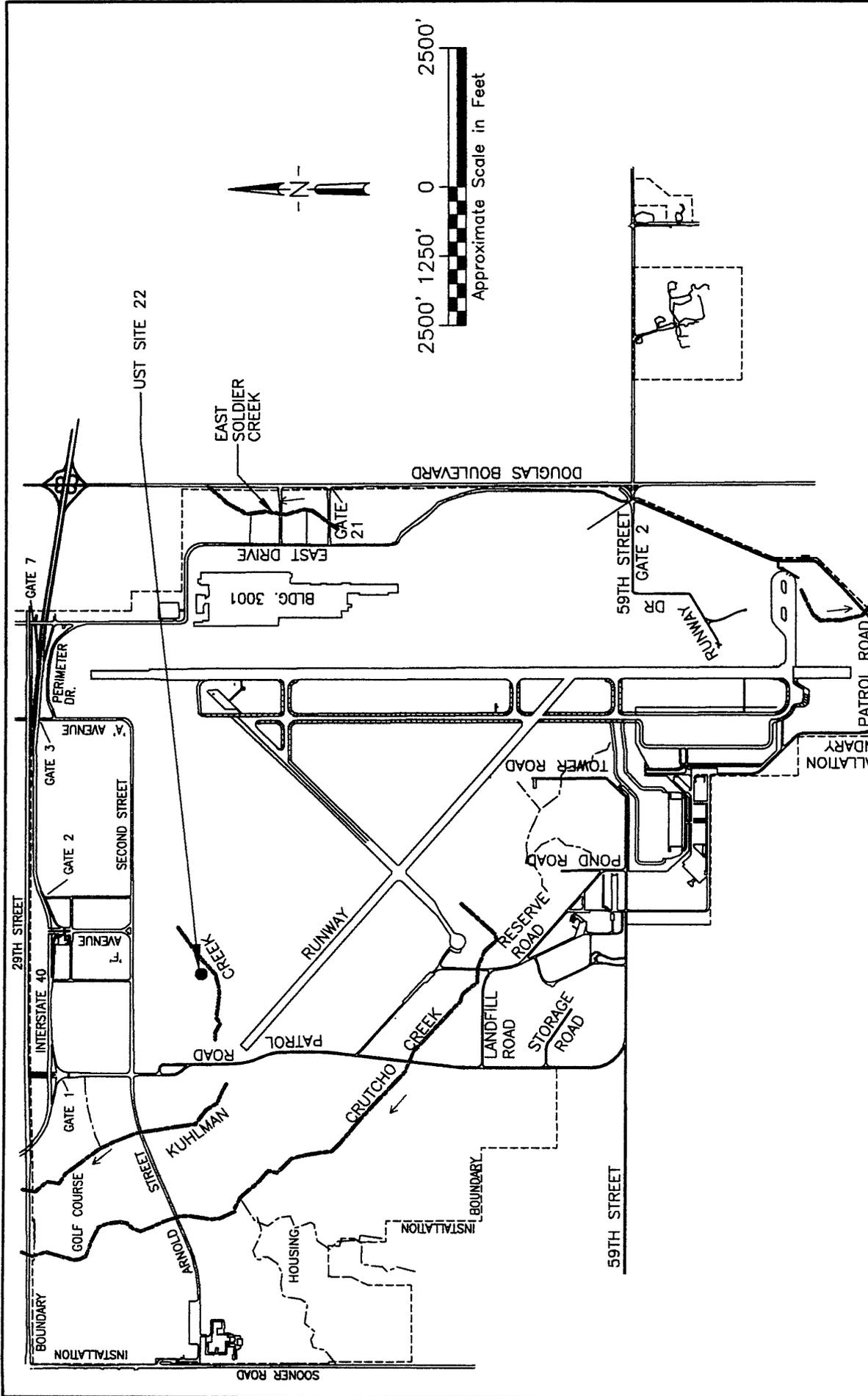


FIGURE 1.3

SURFACE WATER
DRAINAGE PATHS

TINKER A.F.B., OKLAHOMA

SECTION 2

CURRENT SITE STATUS

2.1 CLIMATOLOGY

The climate at Tinker AFB is characterized by long, hot summers (occasional droughts of varying duration occur), and comparatively mild winters. During the summer months, average daily temperatures range from approximately 66 to 94 degrees Fahrenheit (°F). During the winter months, average daily temperatures range from approximately 26 to 54°F. Maximum precipitation generally occurs in May, and the average annual precipitation for the region is 40.45 inches. The average evaporation rate is approximately 50 inches. The prevailing wind direction is southerly; however northerly and southerly winds occur with about equal frequency from December to March. The average monthly wind speed varies from 12 miles per hour in July and August, to 16 miles per hour in March and April. Strong, gusty winds occur with thunderstorms and low-pressure systems that migrate from west to east during winter and spring. Severe storms occur more frequently in the spring, but can occur in any month of the year (Parsons ES, 1999).

2.2 GEOLOGY AND SOIL

Subsurface (bedrock) geologic units at Tinker AFB consist of, in descending order, the Hennessey Group, the Garber Sandstone, and the Wellington Formation. The bedrock units are comprised of a sequence of sandstones, siltstones, and shales. These formations are about 900 feet thick.

Subsurface soils around UST Site 22 generally consists of reddish brown silty clays and sandy silts to a depth of approximately 25 feet below ground surface (bgs). Within this unit are silty clays with thin gray silt seams and weathered sandstones that comprise the Hennessey Formation. Below this formation are moderately well-sorted reddish-brown sands that form the Garber Sandstone. The silt content decreases and the grain size increases with depth in this region.

The surface soils of the installation area are of three predominant types: residual, alluvial, and urban land. The predominant soils are the Stephenville-Darsil, Renthen-Urban Land Complex, Kirkland-Urban Land Complex, and Urban Land (USDA, 1996). Geologic units that outcrop at various locations within the Tinker AFB region are composed of Quaternary alluvium and terrace deposits, the Hennessey Group, and the Permian Garber-Wellington Formation. Quaternary alluvium, present along portions of Crutch Creek and Soldier Creek, consists of unconsolidated, interfingering lenses of sand,

silt, clay, and gravel. The terrace deposits, which were deposited by ancient streams, consist mostly of lenticular beds of sand, silt, clay, and gravel (Parsons ES, 1999).

2.2.1 Soil Contamination

Analytical data from 56 soil samples collected during the various investigations of this site revealed that the magnitude of contamination at this site is low. Figure 2-1 illustrates the locations of all the soil borings at UST Site 22. Samples were analyzed for benzene, toluene, ethylbenzene, xylene (BTEX), Total Petroleum Hydrocarbons (TPH) (both Diesel Range Organics (DRO) and Gasoline Range Organics (GRO)), and lead. This data was submitted to the Air Force Center for Environmental Excellence (AFCEE) under the Environmental Resources Program Information Management System (ERPIMS) data management program. The ERPIMS site identification code number is 122. Table 2-1 summarizes the analytical data for the OCC COC's.

Analytical data indicate high levels of TPH in the subsurface soils at two general areas. TPH contamination levels in excess of 500 ppm occur generally at a depth range of 6 to 12 feet below ground surface (bgs) in the two contaminated areas. UST 487 (diesel fuel tank) is not within the area exceeding TPH levels, which is to the east and upgradient of the tank. The contamination west-southwest of Building 486 and east of UST 487 may be the result of activities associated with the transport pump facility at Building 486. The maximum detected TPH level (combined purgeable and extractable) in the soil was 6830 mg/kg. Maximum detected BTEX levels were benzene - 3.91 mg/kg, toluene - 17.8 mg/kg, ethylbenzene - 40.4 mg/kg, and xylenes - 72.7 mg/kg. Recent soil samples collected in March 1998 from a confirmation boring between soil boring 17 and Kuhlman Creek exhibited low levels of contaminants.

2.3 HYDROGEOLOGY

The groundwater conceptual model of Tinker AFB was formed by the integration of geologic and hydrologic data from across the base. The hydrogeologic system at Tinker AFB is complex, and the model provides both an approximation of depth to water and an estimated direction of groundwater movement (Parsons ES, 1999). The groundwater and hydrogeologic system in the vicinity of UST Site 22 has been investigated and is evaluated as part of a basewide groundwater study by the IT Corporation (IT, 1999).

Approximately 1,150 groundwater monitoring wells have been installed at the base during remedial investigations. The conceptual hydrologic model, based largely on data from these wells, divides the groundwater system under Tinker AFB into three principal aquifer zones: an upper saturated zone (USZ), a lower saturated zone (LSZ), and a producing zone (PZ). The PZ starts at an average depth of 200 or 250 feet bgs at Tinker

AFB. In addition, a less extensive zone, the Hennessey saturated zone (HSZ), has also been identified above the USZ on a portion of the base. Numerous shallow, thin saturated beds of siltstone and sandstone may exist within the HSZ throughout the base (Parsons ES, 1999).

The USZ and LSZ are recognized over the entire Base. The USZ exists mainly under water table (unconfined) conditions basewide, although subunits appear to be partially confined locally. The LSZ is unconfined on the east side of the base, but becomes confined west of Building 3001 and the North-South runway. The USZ and LSZ are separated by a low permeability shale interval of variable thickness. The shale interval acts as the lower confining bed for the USZ in the vicinity of the UST Site 22 (Parsons ES, 1999).

Groundwater flow in the USZ at UST Site 22 is to the west-southwest and the average depth to groundwater is 4.1 ft bgs. Hydraulic conductivity in this unit was measured from slug tests in ranges from 1.225E-05 cm/sec to 5.9E-04 cm/sec. (Parsons 1998).

2.3.1 Groundwater Contamination

As part of the investigation of the site (Parsons ES, 1998), six soil borings were completed as monitoring wells in the area surrounding the subject site. The well screens were set from approximately 5 to 15 feet bgs. Figure 2-1 illustrates the locations of the monitoring wells. These six monitoring wells were sampled in March 1998, and analyzed for VOC's, Naphthalene, and TPH (GRO and DRO). Table 2-2 summarizes the analytical data for the COC's. Analytical data from the monitoring wells show maximum benzene concentration of 0.0014 mg/L at MW 122-2-420B. Toluene, ethylbenzene, and xylene were not detected above the detection limits. TPH GRO levels ranged from non-detect to 3.0 mg/l. TPH DRO levels were below the detection limit of 1 mg/l. None of the groundwater sample concentrations exceeded the OCC action levels or the risk based screening levels (RBSLs).

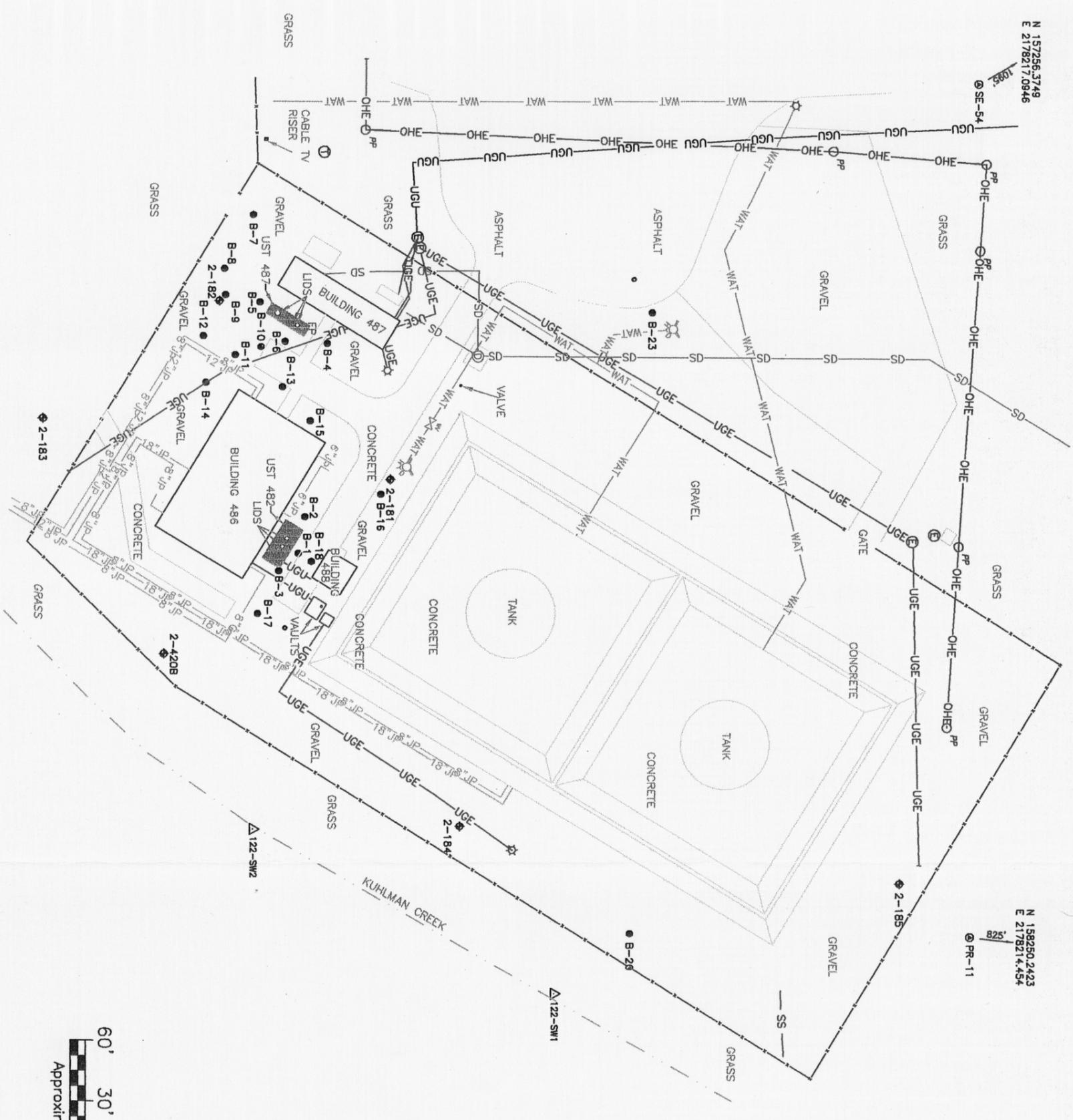
2.4 SURFACE WATER

Surface water at UST Site 22 drains west towards Kuhlman Creek, which is located approximately 100 feet west of the site. Kuhlman Creek is considered a losing stream in the vicinity of Site 22; therefore, the aquifer in this area is being recharged by the creek. Two stream bank samples from the creek were collected as part of the site investigation and analyzed for VOC's, naphthalene, and TPH (GRO and DRO). Table 2-2 summarizes the analytical data for the COC's. None of the stream water sample concentrations exceeded the OCC action levels or the risk based screening levels (RBSLs).

2.5 RECEPTORS

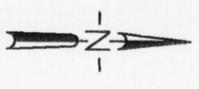
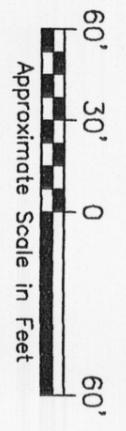
Human receptors in the vicinity of UST Site 22 are divided into two groups; on-base and off-base receptors. Base personnel reside in base housing located approximately one mile west and southwest of the site. The closest off-base residence is located 4,000 feet north of the site in a residential area of Midwest City. Commercial on-base workers occupy the various buildings around the site. The closest occupied building to the site is the Base Support Supply Building, Building 469, which is located approximately 500 feet to the north.

There are 9 base water supply wells and 2 off-base private water wells within a one-mile radius of the site. The nearest on-base water well is about 3,500 feet to the west. All base water supply wells are completed from the Production Zone of the Garber-Wellington, which is the confined portion of the aquifer. The nearest off-base private water well is about 4,500 feet to the north of UST Site 22.



N 157256.3749
E 2178217.0846

N 158250.2423
E 2178214.454



LEGEND:

- CREEK FLOWLINE
- UGU UNDERGROUND UTILITY (6"-7" bgs.)
- GAS LINE
- OHE OVERHEAD ELECTRIC LINE
- UGE UNDERGROUND ELECTRIC (6"-7" bgs.)
- 12"JP 12" JET FUEL LINE
- 8"JP 8" JET FUEL LINE
- 6"JP 6" JET FUEL LINE
- SS SANITARY SEWER LINE (8"-9" bgs.)
- FENCE
- SD STORM DRAIN
- ⊕ ELECTRIC MANHOLE
- ⊕ TELEPHONE MANHOLE
- ⊕ ELECTRIC LIGHT POLE
- ⊕ FIRE HYDRANT
- ⊕ POWER POLE
- ⊕ WATER VALVE
- ⊕ FP FILL PORT
- B-20 BORING
- ◆ 2-184 MONITOR WELL
- △ 122-SW1 SEDIMENT LEACHATE LOCATION MONUMENT
- ⊙ PR-11 MONUMENT

NOTE:

1. UNDERGROUND UTILITIES SHOWN WERE THOSE MARKED ON THE GROUND. NO OTHER UTILITY RESEARCH HAS BEEN PERFORMED. HORIZONTAL AND VERTICAL DATUM PROVIDED BY TINKER AIR FORCE BASE. HORIZONTAL ~ NAD27 VERTICAL ~ MVD 29 MONUMENTS USED: PR11 SES4

Figure 2.1

UST SITE 22
SITE MAP

TINKER A.F.B., OKLAHOMA

Table 2.1 Analytical Data Summary for Soil

MW No./Sample Location	Sampling Date	Sample Depth [ft.]	Benzene [mg/kg]	Toluene [mg/kg]	Ethylbenzene [mg/kg]	Xylene [mg/kg]	TPH/GRO [mg/kg]	TPH/DRO [mg/kg]
BW22-B7-6	6/28/95	6.0-6.5	<0.001	<0.001	<0.001	<0.001	0.0095	<2
BW22-B7-16.5	6/28/95	16.5-17.5	<0.001	<0.001	<0.001	<0.001	<0.010	<2
BW22-B8-6	6/28/95	6.0-7.0	<0.001	0.0009	0.0012	0.0042	0.035	<2
BW22-B8-16	6/28/95	16.0-17.0	<0.001	0.0008	<0.001	<0.001	0.0116	<2
BW22-B9-5.5	6/28/95	5.5-6.5	<0.001	0.0026	0.003	0.0102	0.512	<2
BW22-B9-17.5	6/28/95	17.5-18.0	<0.001	<0.001	<0.001	<0.001	0.0187	<2
BW22-B10-8.6	6/28/95	8.6-9.0	0.184	0.813	0.978	4.49	295	63
BW22-B10-9.7	6/28/95	9.7-10.0	<0.005	0.0767	0.099	0.31	290	180
BW22-B10-10.6	6/28/95	10.6-11.0	0.174	0.49	0.544	2.36	222	7.7
BW22-B10-19.5	6/28/95	19.5-20.0	<0.001	<0.001	0.0019	0.0081	0.012	<2
BW22-B11-6	6/29/95	6.0-7.0	<0.001	0.0014	0.0014	0.0053	0.219	<2
BW22-B11-8	6/29/95	8.0-8.5	<1.250	4.95	5.38	24.5	129	59.4
BW22-B11-13	6/29/95	13.0-13.5	<0.001	0.0017	0.0012	0.0076	0.479	<2
BW22-B11-16.5	6/29/95	16.5-17.0	<0.001	0.0009	0.0014	0.0024	0.407	<2
BW22-B12-8.5	6/29/95	8.5-9.0	<0.005	0.0042	0.0054	ND	0.816	11.1
BW22-B12-18	6/29/95	18-18.5	<0.001	<0.001	<0.001	<0.001	<0.010	<2
BW22-B13-8	6/29/95	8.0-8.5	<1.25	17.4	17.8	71.1	5370	1460
BW22-B13-12.5	6/29/95	12.5-13.0	<0.001	<0.001	<0.001	0.0006	0.0275	<2
BW22-B13-17	6/29/95	17.0-17.5	<0.001	<0.001	<0.001	0.001	0.0565	<2
B22-B14-6.5	6/30/95	6.5-7.0	<0.001	0.0033	0.0022	0.0083	0.208	<2
B22-B15-8.5	6/30/95	8.5-9.0	<0.005	0.0404	0.0331	0.128	22.9	39.1
B22-B15-10.5	6/30/95	10.5-11.0	<0.005	<0.005	0.0132	0.0465	267	9.1
BW22-B15-19.5	6/30/95	19.5-20	<0.001	0.0007	<0.001	<0.001	0.0142	<2
BW22-B16-9.5	6/30/95	9.5-10.0	0.285	0.554	3.45	5.03	589	157
BW22-B16-18.5	6/30/95	18.5-19.0	<0.001	<0.001	<0.001	<0.001	0.0532	<2
BW22-B17-8.5	6/30/95	8.5-9.0	3.91	1.67	8.93	30.5	333	480
BW22-B17-9.5	6/30/95	9.5-10.0	<0.001	<0.001	<0.001	0.0006	0.237	<2
BW22-B17-19.5	6/30/95	19.5-20.0	<0.001	<0.001	<0.001	<0.001	0.0126	<2
BW22-B18-8.5	6/30/95	8.5-9.0	1.07	0.819	9.44	6.54	1330	251
BW22-B18-16.5	6/30/95	16.5-17.0	<0.001	<0.001	<0.001	<0.001	<0.010	<2

Table 2.1 (Continued)
Analytical Data Summary for Soil

MW No./Sample Location	Sampling Date	Sample Depth [ft.]	Benzene [mg/kg]	Toluene [mg/kg]	Ethylbenzene [mg/kg]	Xylene [mg/kg]	TPH/GRO [mg/kg]	TPH/DRO [mg/kg]
BW22-B19-7	7/10/96	7.0-8.0	<0.001	<0.001	<0.001	<0.001	<0.010	<2
BW22-B19-22	7/10/96	22.0-23.0	<0.001	<0.001	<0.001	<0.001	<0.010	<2
BW22-B20-6	7/10/96	6.0-6.5	<0.001	<0.001	<0.001	<0.001	<0.010	<2
BW22-B20-17	7/10/96	17.0-18.0	<0.001	<0.001	<0.001	<0.001	<0.010	<2
BW22-B21-7	7/10/96	7.0-7.5	<0.001	<0.001	<0.001	<0.001	<0.010	<2
BW22-B21-21.7	7/10/96	21.7-22.2	<0.001	<0.001	<0.001	<0.001	<0.010	<2
B22-B10-24.5	6/28/96	24.5-25.5	<0.001	0.0005	<0.001	<0.001	<0.010	<2
BW22-B18-22	6/30/96	22-22.5	0.717	0.784	6.18	<0.001	<0.010	<2
BW22-B2-9	2/23/94	9-9.5	<.005	0.0034	0.0549	4.15	876	254
BW22-B2-21	2/23/94	21-21.5	<0.001	<0.001	<0.001	0.106	8760	66.3
BW22-B1-2.5	2/24/94	2.5-3.0	0.0053	0.0114	0.0518	0.0019	0.01	1.6
BW22-B1-7	2/24/94	7-7.5	0.185	0.0175	0.22	0.153	1560	7.2
BW22-B1-16	2/24/94	16-16.5	<0.001	0.0007	0.0033	0.279	657	479
BW22-B1-12	2/24/94	12-12.5	<0.001	<0.001	<0.001	0.0055	0.0091	<1
BW22-B3-6.5	2/24/94	6.5-7	3.18	3.92	40.4	<0.001	0.01	2.6
BW22-B3-21.5	2/24/94	21.5-22	<0.001	<0.001	0.0005	72.7	1100	1260
BW22-B4-4	2/24/94	4-4.5	0.0042	0.0033	0.0189	0.0009	0.011	2.6
BW22-B4-9	2/25/94	9-9.5	0.001	0.0012	0.0048	0.0265	11.4	8.8
BW22-B4-24	2/25/94	24-24.5	<0.001	<0.001	<0.001	0.008	0.577	45.1
BW22-B5-9	2/25/94	9-9.5	<0.001	0.0011	0.0035	<0.001	0.0086	<1
BW22-B5-23	2/25/94	23-23.5	<0.001	<0.001	<0.001	0.0064	0.529	16.2
B22-B6-4.5	2/25/94	4-5-5	0.0014	0.0038	0.023	<0.001	<0.010	<1
BW22-B6-8	2/25/94	8-8.5	1.25	1.29	12.5	0.033	1.93	15.6
BW22-B6-17.5	2/25/94	17.5-18	<0.001	<0.001	<0.001	7.71	580	590
						<0.001	0.438	5.4

Table 2.2 Analytical Data Summary for Groundwater and Surface Water

MW No./Sample Location	Installation Date	Screen Interval	Sampling Date	Water Level	Benzene [mg/l]	Toluene [mg/l]	Ethylbenzene [mg/l]	Xylene [mg/l]	Naphthalene [mg/l]	TPH/GRO [mg/l]	TPH/DRO [mg/l]
2-181	7/12/95	5-15'	3/20/98	5.13	<0.003	<0.005	<0.005	<0.006	<0.01	<1	<1
2-182	7/6/95	5-15'	3/20/98	4.15	<0.003	<0.005	<0.005	<0.006	<0.01	3	<1
2-183	7/6/95	4.5-14.5'	3/20/98	7.15	<0.003	<0.005	<0.005	<0.006	<0.01	<1	<1
2-184	7/11/95	4-14'	3/20/98	6.95	<0.003	<0.005	<0.005	<0.006	<0.01	<1	<1
2-185	7/11/95	4.5-14.5'	3/20/98	6.65	<0.003	<0.005	<0.005	<0.006	<0.01	<1	<1
122-SW-1	3/19/98	2-5'	3/20/98	NA	<0.003	<0.005	<0.005	<0.006	<0.01	<1	<1
122-SW-2	3/19/98	2-5'	3/20/98	NA	<0.003	<0.005	<0.005	<0.006	<0.01	<1	<1
122-2-420B	3/16/98	5-15'	3/23/98	6.57	0.0014	<0.005	<0.005	<0.006	<0.01	<1	<1

SECTION 3

RISK DETERMINATION

The ORBCA investigation of the soil and groundwater at UST Site 22 indicates that subsurface contamination does not exceed the risk-based screening levels (Tier 1) or the modified risk-based screening levels (Tier 1A) for OCC regulated contaminants. Sample concentrations were either below action levels established in OAC 165:25-3-65 or did not exceed the ORBCA Tier 1/1A risk-based screening levels for all pathways and receptors identified. In addition, no nuisance conditions were observed. Complete descriptions of these pathways and receptors are presented in the ORBCA report for this site (Parsons ES, 1998).

SECTION 4

NO FURTHER ACTION

The risk to human health and the environment is low, based on the analytical results; therefore, the no action alternative is proposed on the basis that this site is below action levels. No evidence suggests that the groundwater, surface water, soil, or air is sufficiently contaminated by the UST Site 22 to pose any threat to human health or the environment. Current site conditions and environmental testing data indicates that no further action is warranted at the UST Site 22. Additionally, the secured nature of the site and the limited exposure pathways support this alternative.

The groundwater in the USZ, and the underlying zones remains under the regulatory jurisdiction and enforcement of the ODEQ. The groundwater beneath this site is being addressed under RCRA requirements. The monitoring wells installed during the UST Site 22 investigation will continue to be used for groundwater monitoring in this area. Any further actions associated with the groundwater will be coordinated through the ODEQ.

SECTION 5

REFERENCES

- IT Corporation, September 1999, Basewide Non-NPL Groundwater Phase II RCRA Facility Investigation for Appendix I and II SWMUs, Addendum 1, Volume 1-3, Tinker Air Force Base, Oklahoma.
- Tetra Tech, 1994, Initial Site Characterization Report for UST Site 22, Tinker Air Force Base, Oklahoma.
- Tetra Tech, 1996. Final Investigations for Soil and Groundwater Cleanup for Site 22, Tinker Air Force Base, Oklahoma.
- Parsons ES, October 1998, Oklahoma Risk-Based Corrective Action Tier 1/1A Summary Report for UST Site 22, Tinker Air Force Base, Oklahoma.
- Parsons ES, April 1999, Revision 1, Site Investigation Workplan for the Southeast Quadrant Wastewater Collection System, Tinker Air Force Base, Oklahoma.
- USDA, 1996, Draft-Preliminary Revised Soil Maps and Soil Designations Atlas Sheet #25 for Oklahoma County, Oklahoma.

APPENDIX A

CLOSURE NOTICE

BOB ANTHONY
Commissioner

ED APPLE
Commissioner

DENISE A. BODE
Commissioner



OKLAHOMA CORPORATION COMMISSION
PETROLEUM STORAGE TANK DIVISION
(405) 521-4683 FAX: (405) 521-4945

JIM THORPE BUILDING, RM 238 • PO BOX 52000-2000 • OKLAHOMA CITY, OK 73152-2000

September 24, 1999

Case ID # 064-1106
Facility D # 55-08120
Final Closure

CERTIFIED MAIL, RETURN RECEIPT REQUESTED
CERTIFICATE NUMBER Z 402 839 049

Ms. Cathy Scheirman, Chief
Tinker AFB, OC-ALC/EMR
7701 2nd Street, Suite 204
Oklahoma City, OK 73145-9100

RE: Site 22, USTs 482 & 487, Tinker AFB, Oklahoma City

Dear Ms. Scheirman:

Based upon our review of the Oklahoma Risk-Based Corrective Action Report submitted for Site 22, USTs 482 and 487, located at Tinker AFB, in Oklahoma City, case 064-1106 is closed.

If in the future, levels of Chemicals of Concern are discovered to exceed those determined appropriate for the site, the case will be reopened.

A copy of this letter is also being sent to your consultant.

If you have any questions, please discuss them with your consultant or call me at (405) 522-1446 between 8:00 a.m. and 4:30 p.m. Monday through Friday. Please reference the appropriate OCC Facility Number and Case Number on all correspondence.

Sincerely,

Joseph E. Lopez
Project Environmental Analyst

Mr. John Osweiler
Parsons Engineering Services, Inc.
5600 Liberty Parkway, Suite 700-C
Midwest City, Oklahoma 73110-2835

NOTE: The applicable Corporation Commission rule is found in the Oklahoma Administrative Code at 165:25-3-79. If you need a copy, please call us and we will send you one.

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